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10/669,783

09/23/2003

Hugh Walsh

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MCGUIREWOODS, LLP  
1750 TYSONS BOULEVARD  
SUITE 1800  
MCLEAN, VA 22102

EXAMINER

JUNTIMA, NITTAYA

ART UNIT

PAPER NUMBER

2616

MAIL DATE

DELIVERY MODE

05/16/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

Application No.

10/669,783

Applicant(s)

WALSH, HUGH

Examiner

Nittaya Juntima

Art Unit

2616

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 23 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-52 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4, 7-17, 20-28 and 31-52 is/are rejected.
- 7) ☒ Claim(s) 5, 6, 18, 19, 29 and 30 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 September 2003 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 9/23/03, 2/28/05.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Drawings*

1. Figures 2 and 3 (see paragraphs 17 and 18 of the specification) should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### *Specification*

2. The disclosure is objected to because of the following informalities:

- in paragraph 2, the status and, if applicable, corresponding U.S. patent number of the U.S applications cited should be updated;
- in paragraph 62, lines 5-6, "Please list...variations." should be removed;
- the claim limitations recited in claims 37-52 lack antecedent basis in the specification;

the claim subject matter of claims 37-52 appears to be related to an upstream node and its operations in response to the reception of the pause frame and the pause release frame which are not disclosed in the Detailed Description section of the specification.

Appropriate correction is required.

***Claim Objections***

3. Claims 1-6, 12-13, 37-38, 42, and 45 are objected to because of the following informalities:

- in claims 1-6, 12-13, and 37-38, “adapted to” should be change to “configured to” should be changed to make the limitations positive. An alternative to the suggested change would be a written confirmation stating that the claimed element performs the actual function following “adapted to.” It has been held that the recitation that an element “adapted to” perform a function is *not* a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense (see MPEP §2106);

- in claim 5, lines 9, “from” should be changed to “of” since buffer(s) is used to store data of the frame, see claim 5 line 4 and page 11, lines 1-11 of the specification;

- in claims 38 and 45, line 4, “release” should be inserted after “pause”;

- in claim 42, line 1, “further comprising” should be changed to “wherein”, and line 2, “a memory” should be changed to “the memory” to refer the memory in line 2 of claim 37.

Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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Claims 12-13, 23-24, 38, 42-43, and 45 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 12 and 23, line 3, the limitation “the pause threshold” lacks antecedent basis.

In claims 13 and 24, line 3, the limitation “the pause release threshold” lacks antecedent basis.

In claims 12, 13, 23, and 24, line 2, it is unclear how a reserve module reserves “one or more of the buffers” that are already in use (i.e., store the data, see “the buffers” as defined in independent claim 1, lines 3-4 and 6 and claim 25, lines 4 and 5-6). Based on paragraph 33 of the specification, pointers contained in the reserve module 406 are pointers to available buffers that are reserved to be used for the port housing that reserve module. Therefore, the claims are vague and indefinite. Accordingly, in order to be consistent with paragraph 33 of the specification, the limitation “one or more of the buffers” in line 2 is now interpreted as “one or more of buffers” which refer to buffers that are reserved -- available and not in use.

In claims 12, 13, 23, and 24, line 6, it is unclear how the limitation “the number of the buffers neither reserved nor enqueued” can be used as a function of the predetermined/pause threshold since “the buffers” refer to the same buffers that are already in use as defined in independent claim 1, lines 3-4 and 6 and claim 25, lines 4 and 5-6. Therefore, the claims are vague and indefinite. However, based on FreeSize variable in equation (1) and paragraphs 33, 47-49 of the specification, the limitation is interpreted as “the number of buffers neither reserved nor enqueued.”

In claims 38 and 45, line 4, it is unclear why the egress module would resume transmission of the frames in response to "the pause frame." Therefore, the claims are vague and indefinite. However, in light of a pause release frame defined in line 2 of claims 38 and 45, "the pause frame" in line 4 of claims 38 and 45 is interpreted as "the pause release frame".

In claim 42, line 2, the limitation "the buffers" lack antecedent basis.

***Claim Rejections - 35 USC § 101***

5. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 31-36 and 51-52 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims 31 and 51 claim "a computer program" which is nonstatutory functional descriptive material as stated in the MPEP 2106.01 Computer-Related Nonstatutory Subject Matter. The computer program is not stored on a computer-readable medium embodying instructions executable by a computer, which does not permit the computer program's functionality to be realized. It is suggested that the applicant rewrite lines 1-3 of claims 31 and 51 in terms of "a computer readable medium having a stored computer program embodying instructions for controlling an apparatus having an ingress module connected to a channel and an egress module connected to the channel, which, when executed by a computer, causes the computer to perform the steps comprising: ". In addition, the preamble of the dependent claims 32-36 and 52 should be revised accordingly.

***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1-4, 7-17, 20-28, 31-34, and 37-52 are rejected under 35 U.S.C. 102(e) as being anticipated by Feuerstraeter (hereinafter “Feuer”) (US 2003/0123393 A1).

Regarding claim 1, as shown in Fig. 2, Feuer teaches a network switching device (enhanced network interface 120 of device 104, Fig. 1) comprising:

An ingress module configured to receive frames of data from a channel (106 in Fig. 1, paragraph 21), wherein each frame of data (content with a header) has one of a plurality of classes of service (CoS), and to store the data in one or more buffers (one or more buffers reads on inherent memory locations to be occupied by data in the respective buffer queues 302, 304, and 306 in Fig. 3) (an ingress module reads on means in the flow control agent 214 that receives and stores a content having a CoS in the memory location(s) of the buffer queue corresponding to the content’s identified priority level, paragraph 30, see also paragraphs 28 and 32).

An egress module configured to exercise flow control on the channel for each of the class of service when the number of the buffers (number of buffers reads on number of inherent occupied memory locations in each of the buffer queues 302, 304, and 306, Fig. 3) storing frames of data received from the channel and having the class of service but not yet transmitted from the network switching device exceeds a predetermined threshold for the class of service (an

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egress module reads on means in the flow control agent 214 that generates a control message in order to suspend transmission of content having a priority level associated with buffer queue 302, 304, or 306 in Fig. 3 whose number of occupied memory locations has reached a threshold 308, paragraphs 32-33).

Regarding claim 2, Feuer also teaches that the egress module is further configured to send a pause frame (a control message) to the channel, and wherein the pause frame indicates the one of the classes of service (means of the flow control agent 214 that generates and sends a control message denoting the priority level associated with the buffer that has reached the threshold 308 to a receiving device over link 106, Fig. 1, paragraphs 33 and 35).

Regarding claim 3, Feuer also teaches that the egress module is further configured to terminate flow control on the channel for each of the classes of service when the number of the buffers storing frames of data having the class of service but not yet transmitted from the network switching device falls below a further predetermined threshold (not defined, reads on threshold 308, Fig. 3) for the class of service (means of the flow control agent 214 that issues a revised control command when the buffer queue associated with the priority level becomes available/falls below threshold 308 in order to refresh a disable of communication, paragraph 44, see also paragraph 39, lines 15-22).

Regarding claim 4, Feuer teaches that the egress module is further configured to send a pause release frame (a revised control command) to the channel, and wherein the pause release



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frame indicates the one of the classes of service (means of the flow control agent 214 that issues a revised control command denoting the priority level associated with the buffer queue that becomes available/falls below threshold 308, paragraph 44, see also paragraphs 33 and 39, lines 15-22).

Regarding claim 7, Feuer teaches an integrated circuit (network element 104, Fig. 1, paragraphs 20-21) comprising the network switching device (enhanced network interface 120) of claim 1. See rejection of claim 1.

Regarding claim 8, Feuer teaches a network switch (network element 104, Fig. 1, paragraphs 20-21) comprising the network switching device (enhanced network interface 120) of claim 1. See rejection of claim 1.

Regarding claim 9, Feuer teaches an output-queued network switch (network element 104, Fig. 1 having transmit queues, paragraphs 20-21, 28, and 34) comprising the network switching device (enhanced network interface 120) of claim 1. See rejection of claim 1.

Regarding claim 10, Feuer teaches a memory (I/O buffer 204, Fig. 2) comprising the buffers (paragraphs 28 and 32).

Regarding claim 11, Feuer teaches an integrated circuit (network element 104, Fig. 1, paragraphs 20-21) comprising the network switching device (enhanced network interface 120) of

claim 10. See rejection of claim 10.

Regarding claim 12, Feuer teaches a reserve module (MAC 206, Fig. 2 of device 104, Fig. 1) configured to reserve one of more of the buffers to the channel (since (i) the number of receive queues 302, 304, and 306, Fig. 3 is maintained and managed by MAC 206, paragraph 28, (ii) each queue must contain a finite number of buffers/memory locations for storing the content, and (iii) device 104 is connected to device 102 over link 106, Fig. 1, therefore, the MAC 206 of device 104 must reserves/allocates one or more of the buffers/memory locations of one of the receive queues 302, 304, and 306 to the channel 106 in order to store the content received from device 102, Fig. 1). Feuer also teaches that the predetermined threshold for the channel is a function of the number of buffers neither reserved nor enqueued (as shown in Fig. 3, for each of the buffer queues 302, 304, and 306, threshold 308 depends on the total allocated capacity of each queue, i.e., the total number of available memory locations prior to storing any content, therefore, threshold 308 must be a function of the number of memory locations neither reserved nor enqueued prior to the storing of any content).

Regarding claims 12 and 13, Feuer teaches a reserve module (MAC 206, Fig. 2 of device 104, Fig. 1) configured to reserve one of more of buffers to the channel (because (i) the number of receive queues 302, 304, and 306, Fig. 3 is maintained and managed by MAC 206, paragraph 28, (ii) each queue must contain a finite number of buffers/memory locations for storing the content, and (iii) device 104 is connected to and receives content from device 102 over link 106, Fig. 1, therefore the MAC 206 of device 104 must allocate a number of buffers/memory

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locations for each of the receive queues 302, 304, and 306 for content storing). It is also inherent that the predetermined threshold (threshold 308) is a function of the number of buffers reserved (as shown in Fig. 3, for each of the buffer queues 302, 304, and 306, threshold 308 depends on the total allocated capacity of each queue, i.e., the total number of available memory locations prior to storing any content, therefore, threshold 308 must be a function of the number of memory locations reserved prior to storing of any content).

Claims 14, 15, 16, 17, 20, 21, 22, 23, and 24 are network switching device claims containing similar limitations to device claims 1, 2, 3, 4, 7, 8, 9, 12, and 13, respectively, and are therefore rejected under the same reason set forth in the rejection of claims 1-4, 7-9, and 12-13, respectively.

Claims 25-28 are method claims corresponding to device claims 1-4, respectively, and are therefore rejected under the same reason set forth in the rejection of claims 1-4, respectively.

Claims 31-34 are computer program (paragraph 48) claims corresponding to device claims 1-4, respectively, and are therefore rejected under the same reason set forth in the rejection of claims 1-4, respectively (an apparatus reads on Enhanced Network Interface 120 of device 104 in Fig. 1, a channel 106 must be connected to the inherent ingress and egress modules of the interface 120, see Fig. 2 and paragraphs 30, 32, and 33).

Regarding claim 37, Feuer teaches a network switching device (enhanced network interface 120 of device 102, Fig. 1) comprising:

An egress module configured to retrieve frames of data (content with respective headers) from a memory (I/O buffer 204, Fig. 2 containing transmit queues, paragraphs 28 and 34), and to transmit the frames of data to a channel (106, Fig. 1) (MAC 206 must include an egress module for transmit content retrieved from transmit queues to channel 106, paragraphs 30 and 35).

Wherein each of the frames of data has one of a plurality of classes of service (content received has a CoS, paragraph 29).

An ingress module configured to receive a pause frame (a control message denoting the priority level associated with the buffer which has reached the threshold 308) indicating one or more of the classes of service to be paused (MAC 206 must include an ingress module for receiving a control message, paragraphs 33 and 35).

Wherein, in response to the pause frame, the egress module is further configured to  
cease to transmit the frames of data having the one or more classes of service to  
be paused (paragraphs 33 and 35);

continue to transmit the frames of data not having the one or more classes of  
service to be paused (paragraph 35).

Regarding claim 38, Feuer also teaches that the ingress module is configured to receive a pause release frame indicating one or more of the classes of service to be released (a subsequent/revised control command must be received by the inherent egress module of MAC

206 of device 102, Fig. 1 to eliminate the hold for the particular priority level, paragraph 31, lines 15-20 and paragraph 44).

Regarding claim 39, Feuer teaches an integrated circuit (network element 102, Fig. 1, paragraphs 20-21) comprising the network switching device (enhanced network interface 120) of claim 37. See rejection of claim 37.

Regarding claim 40, Feuer teaches a network switch (network element 102, Fig. 1, paragraphs 20-21) comprising the network switching device (enhanced network interface 120) of claim 37. See rejection of claim 37.

Regarding claim 41, Feuer teaches an output-queued network switch (network element 102, Fig. 1 having transmit queues, paragraphs 20-21, 28, and 34) comprising the network switching device (enhanced network interface 120) of claim 37. See rejection of claim 37.

Regarding claim 42, Feuer teaches that the memory (I/O buffer 204, Fig. 2) comprising buffers (transmit queues, paragraphs 28 and 32).

Regarding claim 43, Feuer teaches an integrated circuit (network element 102, Fig. 1, paragraphs 20-21) comprising the network switching device (enhanced network interface 120) of claim 42. See rejection of claim 42.

Claims 44-48 are network switching device claims containing similar limitations to device claims 37-48, respectively, and are therefore rejected under the same reason set forth in the rejection of claims 37-48, respectively.

Claims 49-50 are method claims corresponding to device claims 37-38, respectively, and are therefore rejected under the same reason set forth in the rejection of claims 37-38, respectively.

Claims 51-52 are computer program (paragraph 48) claims corresponding to device claims 37-38, respectively, and are therefore rejected under the same reason set forth in the rejection of claims 37-38, respectively (an apparatus reads on Enhanced Network Interface 120 of device 102 in Fig. 1, a channel 106 must be connected to the inherent ingress and egress modules of the interface 120, see Fig. 2 and paragraphs 33 and 35).

#### ***Allowable Subject Matter***

8. Claims 5-6, 18-19, and 29-30 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

#### ***Conclusion***

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

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- US 2004/0179476 A1, disclosing apparatus and method for controlling traffic switching operation based on CoS in an Ethernet-based network (Fig. 4-5, 8-10, paragraphs 20-21, 43, 45-47, 49-52, 58-61, 65-67).
- US 2004/0004971 A1, disclosing method and implementation for multilevel queuing (Abstract, Fig. 1, and paragraphs 8-9 and 13).
- US 2004/0081090 A1, disclosing congestion controller for Ethernet switch (Abstract, Figs. 1, 3-6, and paragraphs 50-53).
- US 6,907,453 B2, disclosing a network device with per CoS memory partitioning (Abstract, Figs. 1 and 3, col. 2, lines 23-65, col. 3, lines 11-col. 4, lines 56).
- US 6,714,517 B1, disclosing method and apparatus for interconnecting packet switches with defined SLAs (Abstract, Figs. 6, 8, and 10, col. 4, lines 56-col. 5, lines 22).

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nittaya Juntima whose telephone number is 571-272-3120. The examiner can normally be reached on Monday through Friday, 8:00 A.M - 5:00 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu can be reached on 571-272-3155. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

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applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Nittaya Juntima  
Patent Examiner  
May 8, 2007